

said enclosure housing said hydrogen sponge and said particle filter device, said hydrogen sponge proximal to said inlet, said particle filter device being proximal to said outlet, said hydrogen sponge and said particle filter device arranged within said enclosure such that a gas flowing into said enclosure via said inlet and out of said enclosure via said outlet, must follow a flow path first contacting said hydrogen sorption material and then flowing through the particle filtering device;
wherein said hydrogen sorption material can be thermally regenerated by heating said enclosure.

11. (once amended) A method for purifying a gas, the method suitable for purifying gas to a level of purity sufficient for semiconductor manufacturing, the method comprising the acts of:

cooling the gas to less than 100 degrees C;
flowing the gas under pressure into a gas purification system enclosure via an inlet;
contacting said gas under pressure with a hydrogen sponge disposed within said gas purification system enclosure;
monitoring the temperature of said hydrogen sponge, wherein said flowing is shut down if the temperature of said hydrogen sponge exceeds an alarm temperature;
flowing said gas through a particle filtering device disposed within said gas purification system enclosure; and
flowing said gas out of said gas purification system enclosure via an outlet.

21. (once amended) A heated getter vessel comprising:
a gas heating device;
a quantity of gas purification material;
a quantity of barrier material;
an enclosure having an inlet and an outlet, said enclosure housing said gas purification material and said gas heating device, said gas heating device proximal to the inlet, said

particle filter and said particle filter arranged within said enclosure such that a gas flowing

into said enclosure via said inlet and out of said enclosure via said outlet, must follow a flow path first through said gas heating device, then contacting said gas purification material and then flowing through said barrier material; and
a temperature sensor disposed in a first portion of said purification material, wherein said temperature sensor is located a distance below the top of said first portion of said purification material, wherein said temperature sensor is placed within a melt zone.

Please cancel claim 30.

31. (once amended) A heated getter vessel as recited in claim 29, wherein said temperature sensor is operable to detect a temperature rise of 10 degrees per millisecond.
32. (once amended) A heated getter vessel as recited in claim 29, further comprising an outlet filter proximal to outlet of said getter vessel.
35. (once amended) A method for purifying a gas, the method comprising the acts of:
purifying a gas within a heated getter vessel to obtain a purified gas including the acts of:
heating a gas with a gas heating device;
contacting said heated gas to a quantity of gas purification material wherein, said gas purification material is operative to substantially remove impurities from said heated gas;
providing a barrier layer, wherein said barrier layer having a quantity of barrier material operative to react with a portion of said gas purification material;
determining a melt zone based on either a flow rate of said gas or an age of said gas purification material or a combination thereof;
providing a temperature sensor at said distance from the top of a first portion of said quantity of gas purification material, in such a manner that said temperature sensor falls with said melt zone; and
measuring said heated gas temperature utilizing said temperature sensor.

36. (once amended) A gas purification system comprising:
a system inlet and a system outlet;
a gas to gas heat exchanger having a cool gas inlet, a preheated gas outlet, a heated gas inlet and a precooled gas outlet;
a heated getter vessel having an inlet, an outlet and a heat source;
at least one temperature sensor placed within said heated getter vessel, such that said at least one temperature sensor is within a melt zone of said first quantity of gas purification material;
a gas to air heat exchanger having a precooled gas inlet and a cooled gas outlet;
an integrated hydrogen sorption and particle filter having an inlet and an outlet;
said system inlet in fluid communication with said cool gas inlet on said gas to gas heat exchanger;
said preheated gas outlet on said gas to gas heat exchanger in fluid communication with said inlet on said heated getter vessel;
said outlet on said heated getter vessel in fluid communication with said heated gas inlet on said gas to gas heat exchanger;
said precooled gas outlet on said gas to gas heat exchanger in fluid communication with said precooled gas inlet on said gas to air heat exchanger;
said cooled gas outlet on said gas to air heat exchanger in fluid communication with said inlet on said integrated hydrogen sorption and particle filter; and
said outlet on said integrated hydrogen sorption and particle filter in fluid communication with said system outlet.

39. (new) The getter vessel recited in claim 21, wherein said temperature sensor is a resistance temperature device (RTD) which includes platinum.

40. (new) The getter vessel recited in claim 21, wherein said temperature sensor is a thermistor.

thermocouple

42. (new) The getter vessel as recited in claim 21, wherein said distance is calculated from a flow rate.

43. (new) The getter vessel as recited in claim 21, wherein said distance is calculated from the age of said first portion of getter purification material.

44. (new). The apparatus recited in claim 21, wherein said distance is between 0 and 3 inches below said top surface of first quantity of getter.

45. (new) The apparatus recited in claim 44, wherein said melt zone is between .5 and 2.5 inches below the said top surface of first quantity of getter.

46. (new) The gas purification system of claim 1, wherein a temperature sensor is placed in said hydrogen sorption material.

47. (new) The gas purification method of claim 11, wherein said alarm temperature is approximately 100 degrees centigrade.

48. (new) A gas purification system providing hydrogen sorption and particle filtering, said gas purification system comprising:

- a) a hydrogen sponge including hydrogen sorption material;
- b) a particle filtering device; and
- c) an enclosure having an inlet and an outlet,

said enclosure housing said hydrogen sponge and said particle filter device, said hydrogen sponge proximal to said inlet, said particle filter device being proximal to said outlet, said hydrogen sponge and said particle filter device arranged within said enclosure

flowing through the particle filtering device